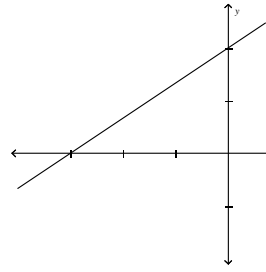


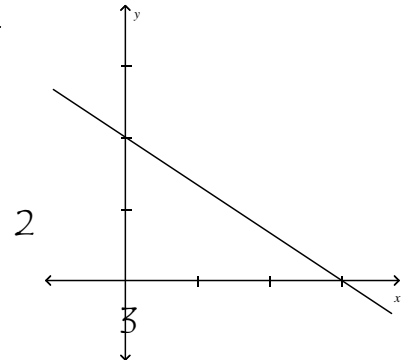
MPM2D – LEAD UP TASK #1

Part of a student's Level 4 solution might include:

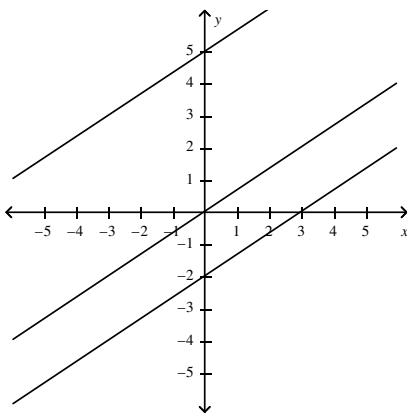
- Slope of line $m = \frac{2}{3}$
 - rise = 2, run = 3
 - the ratio of rise to run is 2 : 3



- negative slope $-\frac{2}{3}$ has the same ratio of rise to run



- lines with slope of $\frac{2}{3}$:
 - general representation: $y = \frac{2}{3}x + b$
 - their graphs are parallel lines with different y-intercepts



$$y = \frac{2}{3}x + 5 \quad y = \frac{2}{3}x \quad y = \frac{2}{3}x - 2$$

x	y
-3	3
0	5
3	7
6	9

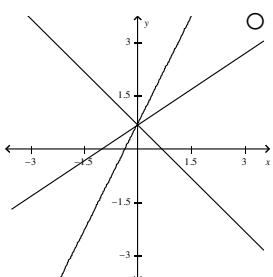
x	y
-6	-4
-3	-2
0	0
3	2
6	4

x	y
-3	-4
0	-2
3	0
6	2

- as expected, when the differences in x-values are 3, then the differences in y-values are 2 \rightarrow the slope is $\frac{\Delta y}{\Delta x} = \frac{2}{3}$

- lines with y-intercept $\frac{2}{3}$:

- general representation: $y = mx + \frac{2}{3}$



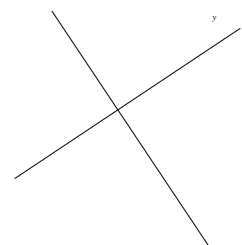
- their graphs are passing through one point $(0, \frac{2}{3})$

$$y = \frac{2}{3}x + \frac{2}{3}$$

$$y = -2x + \frac{2}{3}$$

$$y = x + \frac{2}{3}$$

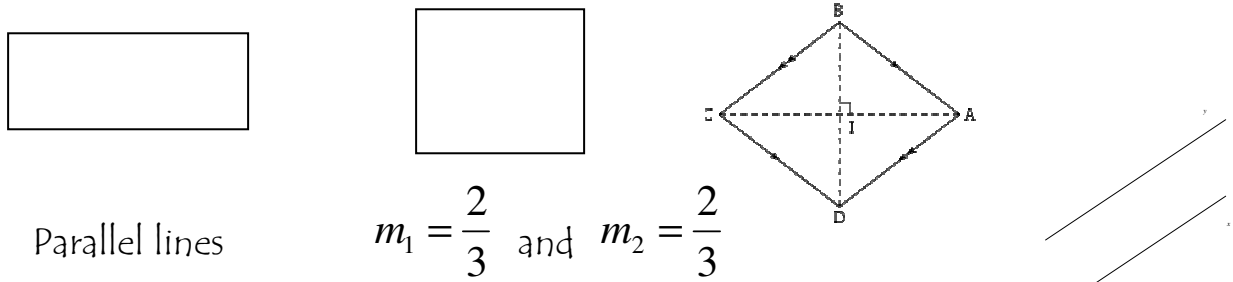
- Perpendicular lines: $m = \frac{2}{3} \quad m_{\perp} = -\frac{3}{2}$



MPM2D – LEAD UP TASK #1

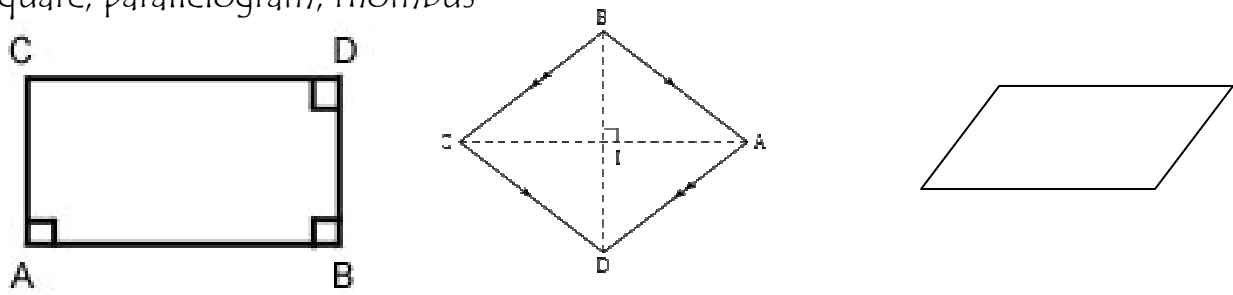
Part of a student's Level 4 solution might include:

- we can use this property in proving that a shape has a right angle – i.e. sides in rectangle or square, right angle triangle, diagonals in rhombus



- Parallel lines $m_1 = \frac{2}{3}$ and $m_2 = \frac{2}{3}$

we can use this property in proving that a shape has a parallel sides – i.e. rectangle, square, parallelogram, rhombus



- Distance between 2 points is $\frac{2}{3}$

- $\frac{2}{3} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

- the points could be $P(0,0)$ and $Q\left(\frac{2}{3},0\right)$

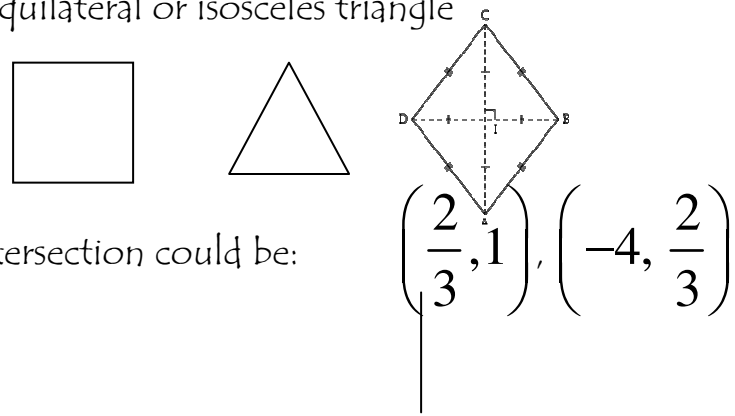
or $P(0,0)$ and $Q\left(0,\frac{2}{3}\right)$

- the points could be: the centre of a circle and a point on a circle:

$$x^2 + y^2 = \frac{4}{9}$$

the center of the circle doesn't have to be in the origin, the distance formula still will be true

- we can use this property to prove that a shape has equal sides – i.e. square, rhombus, equilateral or isosceles triangle



- Point of intersection could be:

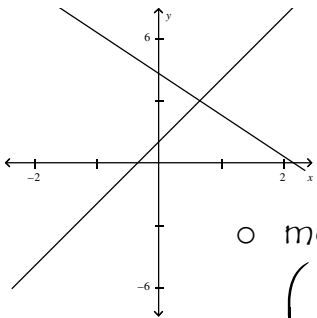
MPM2D – LEAD UP TASK #1

Part of a student's Level 4 solution might include:

- , ...

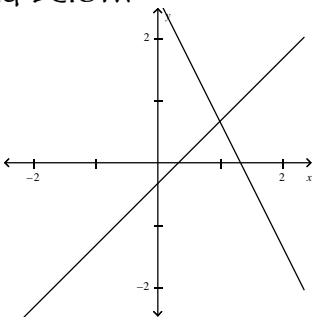
○ $y = 3x + 1$ $y = -2x + \frac{13}{9}$ $y = x - \frac{1}{3}$ $y = -2x + \frac{8}{3}$

are the equations of the intersecting lines sketched below:



$\left(\frac{2}{3}, 3\right)$

$\left(1, \frac{2}{3}\right)$

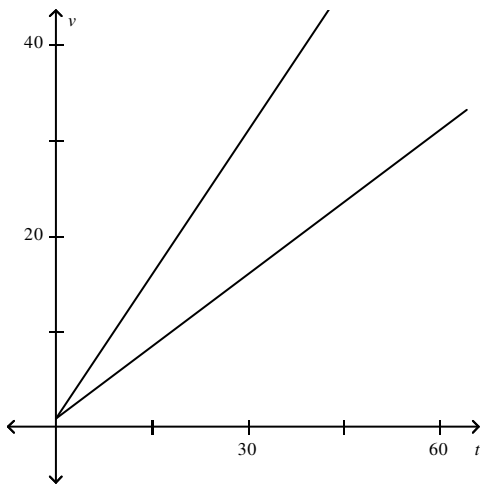


- more general representation of such points :

$\left(\frac{2}{3}, y\right)$ or $\left(x, \frac{2}{3}\right)$

- Initial value in a problem

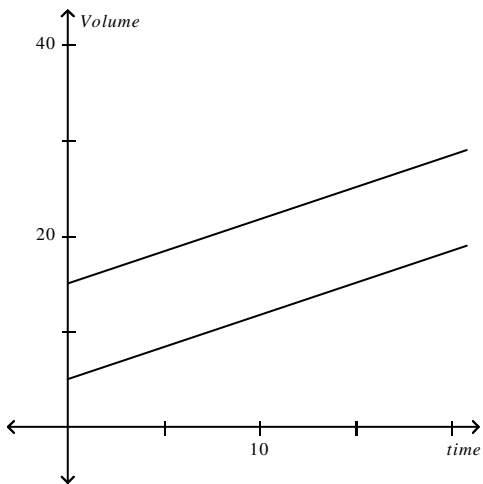
- so on the graph the lines start at the same point $\left(0, \frac{2}{3}\right)$



Two cars are travelling at the speed of $\frac{2}{3}$ m/s when you start measuring their distanced travelled. At the time $t = 0$ s one car increased its speed at 1 m/s and the other car at 0.5 m/s. How do you determine the 'distance travelled after 1 minute?

- Problem with same rate

- on the graph the lines have the same slope of $\frac{2}{3}$



Two containers are being filled with water at the rate of $\frac{2}{3}$ litres per minutes. What do the y-intercepts represent?